MARSHALL STAR

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Marshall Center Deputy Director Carolyn Griner is shown with Alabama State Superintendent Dr. Ed Richardson during the opening luncheon ceremony for American Education Week held Monday at the Huntsville Hilton.

Photo by Terry Leibold

Team at Marshall Ready For STS-87 Science Role

The United States Microgravity Payload-4 will continue to explore the boundaries of microgravity science when the STS-87 Space Shuttle mission, scheduled for launch this afternoon, gets under way. USMP-4 research will be conducted in the areas of materials science, combustion science and fundamental physics. Marshall Center manages USMP-4 as NASA's lead center for microgravity science research.

On orbit, crew members will activate the USMP-4 experiment hardware, while science teams at the Marshall Payload Operations Control Center and other remote sites monitor and adjust experiments, based on data downlinked from Columbia.

"The highly successful USMP series of flights has added a great deal of extremely high quality fundamental information for materials and physical sciences," explained mission scientist Peter

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Employee Update Highlights Education, ISO 9000, Mentoring Effort

American Education Week and the Combined Federal Campaign were major topics of focus Thursday during the last Employee Update of the year. With Center Director Wayne Littles on travel, the event was anchored by Deputy Director Carolyn Griner.

The update also featured briefings on a mentoring initiative by Marshall retiree Bob Ryan, former deputy director of the Structures and Dynamics Laboratory, on ISO 9000 by Associate Director (Technical) Bob Schwinghamer, as well as presentation of length-of-service awards to employees.

The mentoring and learning organization is an effort on the part of NASA and the aerospace industry to meet a new challenge. Griner noted that Ryan is well qualified to lead it since he is "highly regarded for his coaching and mentoring skills."

In explaining why the mentoring program is needed, Ryan said, "We're at a state of permanent 'whitewater' where we face a new challenge of designing aerospace systems to not only meet performance challenges but also meet the cost of reliability and operability at the same time. The only way we can meet a challenge like that is through a learning

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CFC Contributions More Than $445,700

Marshall Center federal government employees, retirees and onsite contractors contributed more than $445,700 to charitable organizations through the 1997 Combined Federal Campaign (CFC).

"We are very pleased that we exceeded our goal of $435,000 during the last week of the campaign," said CFC Chairperson Steven Gaddis. "Amid downsizing efforts and reorganization, the spirit of giving is still at the heart of Marshall employees.

"For the last several years as well as this year, the Marshall Center has had the highest average per capita gift of any government entity,"Gaddis said.

With 83 per cent of the Marshall federal government workforce participating in the campaign, the average gift was approximately $187.

Three more organizations, EB51, ED01 and ED11 concluded the with 100 percent of their employees participating.

The Marshall campaign is part of the Tennessee Valley campaign, which had total 1997 contributions over $1,318,000.

Trafton Announces Plans To Retire from NASA

Wilbur C. Trafton, Associate Administrator for the Office of Space Flight at NASA Headquarters, has announced his intention to leave NASA, effective next month. NASA is proceeding with the search for a successor.

Wil Trafton

Trafton has been the space agency's top official for human space flight since March 1996. During his

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Marshall to Manage Test of Space-Based Wind Sensor

NASA will fly an infrared laser in the cargo bay of the Space Shuttle to see if a space-based sensor can accurately measure global winds within Earth's atmosphere from just above the surface to a height of about 10 miles.

Successful measurements in this key region of the atmosphere could lead to improved weather forecasting and better understanding of climate-related events such as El Niño.

Based on technology tested aboard research aircraft, the Space-Readiness Coherent Lidar Experiment (Sparcle) will detect the frequency shift of an eye-safe laser pulse as it reflects off dust and aerosol particles as they move with the winds. The resulting measurements should give researchers precise information about the speed, direction and vertical profile of tropospheric winds.

Due to launch in 2001 at an estimated cost of $15 million, Sparcle will be managed by the Marshall Center as the second Earth-orbiting mission in the agency's New Millennium Program. If successful, a more robust system based on Sparcle could be a candidate for launch aboard a free-flying satellite within the following few years.

"After several years of critical basic research, the technology to accomplish these measurements has only just reached the point that we could consider demonstrating this promising concept on a Space Shuttle flight," said William Townsend, Acting Associate Administrator for NASA's Office of Mission to Planet Earth. "If this experiment is successful, we expect that the operational deployment of such a capability would produce substantial improvements in the accuracy of weather forecasts, and new insights into the causes and effects of climate change."

Global wind data from an orbiting system has been identified as the number one item on a "wish list" of measurements compiled by the international operational meteorology community, according to Dave Emmitt, Sparcle mission scientist and a research assistant professor at the University of Virginia, Charlottesville.

"This is an exciting time for a number of people who have, until now, had only paper studies to convince their colleagues that winds could be measured accurately from space with lasers," Emmitt added. "The global community of atmospheric researchers, weather forecasters, and weather-sensitive industries will be watching as NASA explores this new frontier of space-based laser sensing of the Earth's winds."

The experiment will be carried to orbit and back in two Space Shuttle Hitchhiker canisters that weigh approximately 200 pounds each. Researchers hope to obtain approximately 50 hours of wind data.

Other partners in the development of Sparcle include NASA's Goddard Space Flight Center, Langley Research Center, the Jet Propulsion Laboratory, Pasadena, Calif.; the University of Alabama at Huntsville, and several private companies.

Space Science Symposium in Huntsville Highlights Mir Results

by Bob Thompson

An international symposium held in Huntsville last week, showcasing the results of Russian space research sponsored by NASA, highlighted joint U.S.-Russian science preparation for the era of the International Space Station.

The investigations were conducted aboard the Mir and funded under Phase I of the International Space Station program.

"The purpose of this symposium was for these researchers to present results," said Kathryn Havens, the director of international programs in NASA's Office of Life and Microgravity Sciences and Applications in Washington, D.C. "What we heard here is research that is meritorious and of use to further investigations aboard the International Space Station," she said.

Areas of research funded by the program include:
- Space Technology and Materials Science Problems
- Geophysical Research
- Space Biology and Medicine
- Earth Natural Resources and Ecology Monitoring
- Solar System Planets and Small Bodies
- Space Biotechnology
- Technical Studies and Experiments
- Space Astronomy
- Systems Engineering Analyses
- Space Power and Propulsion

The symposium co-chairman, Academician Vladimir F. Utkin, chairman of the Russian Science & Technology Advisory Council, is responsible for Russian program management and implementation of U.S.-funded space research.

"Huntsville was picked for the symposium because our Russian colleagues wanted to see the American 'sister city' that also designs rockets," said symposium co-chairman Dr. Arnauld Nicogossian of NASA's Office of Life and Microgravity Science and Applications.

Nicogossian said the experience gained from investigations aboard Mir has helped researchers put their best efforts into the International Space Station.

"This cooperative research effort," added Nicogossian, "has laid the foundation not only for the International Space Station, but for the joint exploration of the solar system."

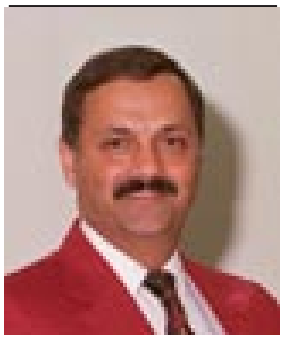
Utkin said he is impressed with how the United States makes great technological advances and yet manages to keep an eye on the environment. "It is important that we preserve our so-small planet Earth," he said.

One of the most important outcomes of the symposium, "An Interchange with the Science and Technology Advisory Council," will be the soon-to-be published papers by the approximately 50 Russian scientists.

The symposium was hosted by the Microgravity Research Program at Marshall.

Marshall Center Engineer Cited for Technology Development

Fred Schramm, an engineer in Marshall's Technology Transfer Office, has been presented the Federal Laboratory Consortium's Southeast Region Award of Excellence for 1997. The award recognized Schramm for his efforts in developing and facilitating the commercialization of a new compressed symbology for identification of products.



Fred Schramm

"The compressed symbology data matrix concept originated in 1982 as part of a NASA-driven effort to develop a better means of interpreting signals sent from spacecraft great distances from the Earth," Schramm said. "During the return to flight effort following the Challenger accident in 1986, a need was recognized for a means of identifying individual parts of the Space Shuttle, particularly within the engines."

Schramm, then working in the Space Shuttle Main Engine project office, helped devise a method of applying the data-matrix compressed symbology marking system directly onto Shuttle parts. "At the time, bar codes were all that was available. They were of fixed size and could only be printed on paper. The compressed symbology markings could be applied in a variety of sizes directly onto Shuttle parts."

The compressed symbology marking system was evaluated by NASA for the Space Shuttle and other programs in 1991. While not adopted by the space agency, the system has found a number of commercial applications. Dozens of everyday items including electronic parts, livestock, mouthwash bottles, medications and automotive parts carry the data-matrix product codes. The system's range of potential applications has led to the establishment of a new commercial endeavor.

Employee Update Recognizes Employees with 40, 35, and 30 Years

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organization where the people are the prime resource."

A learning organization, added Ryan, is founded on personal mastery that has other elements including systems thinking, team learning, a shared vision and mental models.

Associate Director (Technical) Bob Schwinghamer briefed employees on the preassessment audit held last month as part of the ISO 9000 certification process, saying that the results included both "good news" and "bad news."

While the audit identified two "major" areas for improvement — in quality systems and configuration management — Schwinghamer went on to say "we're going to make it, but everybody at all levels of the organization will have to help.

"We've done pretty well so far," said Schwinghamer. "Let's do what Marshall always does, get the job done."

Griner stressed the importance of American Education Week, an annual event being observed this week. With a theme this year of "Teaching People to Think and Dream," Griner emphasized that "this is our opportunity to inform the public of the accomplishments and needs for education in the community."

Summarizing results of the recently concluded Combined Federal Campaign, Griner reported that Marshall's goal for the campaign of $435,000 was significantly exceeded with contributions totaling $445,700. The average gift, said Griner, was $187 and the total was especially significant since it was reached in spite of a decrease in the number of employees.

Griner also highlighted specific Marshall Center accomplishments during 1997, a subject that will be covered in a "Year-in-Review" article that will be published in an upcoming Marshall Star.

Touching on other changes, Griner reported that as of last week, 125 separation incentive applications had been submitted by employees. She answered a variety of questions that had been submitted in advance from employees. Topics included changes in medical center procedures, perceived discrimination at the Center, hiring and promotions and reductions in force.

The update concluded with the presentation of length of service awards to employees who had completed either 40, 35 and 30 years of service.

In addition, Griner presented Marshall employee Pamela Cucarola with the William A. Jump Memorial Foundation Certificate of Recognition.

Dr. Jeff Luvall of the Global Hydrology and Climate Center (GHCC) demonstrates a heat measuring device used in urban warming studies to Susan Cloud, deputy director of Marshall's Human Resources and Administrative Support Office and Marshall Center Deputy Director Carolyn Griner during the GHCC open house held last week. The center's third anniversary observance was attended by industry and university leaders and Marshall employees.

Photo by Emmett Given

Employees Remember: Teachers Who Made a Difference

Editor's Note: A good education is the foundation on which many of life's accomplishments are built, and a good teacher can provide the cornerstone of that foundation. In observance of American Education Week, the Star solicited recollections by Marshall employees of teachers, instructors and professors who had a major contribution in the employee reaching the level he or she has attained in life. Here are some of those memories. Also, photos on the page suggest the range of activities with which Marshall volunteers support education.

Bill Hicks, Chief Counsel:

"My most inspirational professor was Dr. Hope Goodale. I find it strange that, of the many professors I had in college and law school, this is who I would immediately remember as an inspiration. Mrs. Goodale (as she wanted to be called, rather than Dr.) taught Spanish. I never liked the course and cannot speak a word of Spanish today. However, she was an inspiration to me. She taught me to think broadly. In today's vernacular you would say she 'colored outside the lines.'"

Sherman Jobe, Director of Science and Engineering:

"Mrs. Glancye Gray Orman instilled in me confidence that anything for me was possible if I was willing to make the investment of 'effort.' Suffice it to say, for me the return on investment has been incredible! Mrs. Mary Mason Rodgers, with her ability to communicate to us that she honestly cared about each of us, was responsible for me making it through the "rough" times and never giving up."

Carolyn Griner, Deputy Marshall Center Director:

"In the early 1960's there were very few women in engineering and even less encouragement for young girls to pursue their interests in math, chemistry, and physics. I was blessed with a physics teacher in high school, Col. Dillion, who not only acknowledged accomplishments by ALL his students but went the extra mile for me. He personally arranged a meeting that opened the door of the future for my education. I am forever grateful for his guidance and assistance that set me on my life's path."

Mary Harris, Technical Assistant to Director, Astrionics Lab:

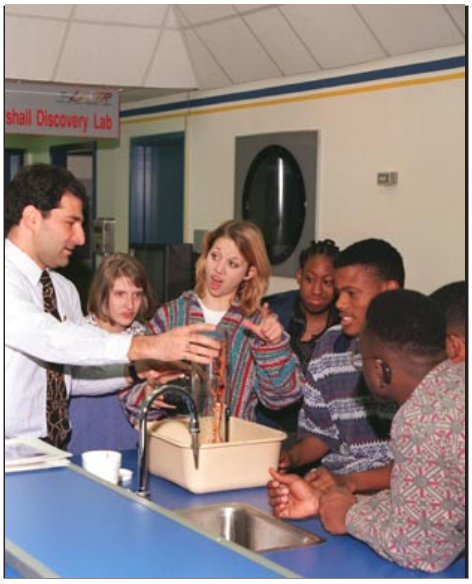
"I attended a two-room schoolhouse called Liberty Hill in Marshall County. My first, second and third grade teacher was Miss Tula Vaughn. Miss Tula encouraged us with praise and positive reinforcement. We all tried to do our best, because doing our best meant that we got a gold star pasted beside our names in the little book that she kept on her desk. We lived for gold stars! When we misbehaved, her sole method of punishment consisted of writing our names on the blackboard.

"How could a woman do so much with little gold stars and names written on a blackboard in chalk? I believe the secret of her success was that she truly loved us. We mattered! And I believe that Miss Tula still has a little book, in a distant corner of her mind, that she pastes stars into whenever I do well."

Art Davis, Electrical Engineer/Team Leader, Astrionics Lab:

Davis remembers Dr. Carl Ventrice, professor of Electrical Engineering at Tennessee Tech University, as an "undisputed scholar" with a remarkable ability to explain complex subject matter. But the professor was most memorable, according to Davis, for his compassion and concern for students — as people. "This came home to me when, during my senior year, I developed a health problem which required an extended hospital stay. Knowing that I was newly married and literally running on our last dollars to finish the year and graduate, he would not let me withdraw from the three classes I had with him. Since these classes were only offered once each year, this would have delayed my graduation until the next school year. Instead, he brought class notes and other material to the hospital and came by many times just to visit and to tell me not to worry about school. This all happened during the middle of the worst snowfall on record in the city."

Dale Watring, Materials Scientist, Space Sciences Laboratory:



"Mary Alice Kline, my third and fourth grade teacher in St. George, W. Va., was able to stimulate all of her students no matter what learning level they were on — not only in math and sciences area but also in the arts and sciences area. I can remember her reading stories to the class every day after our lunch time recess, probably her way of calming us down after playing. This reading time helped me to develop my imagination and I can still remember several of the stories that she read to us.

"During the long and frustrating hours of work in finishing my Ph.D. from MIT, I thought of Dr. Kline's encouraging words and enthusiastic approach toward teaching. This was one of the things that kept me going."

Employees Recall Teachers During American Education Week

Steve Deutschendorf, Systems Analysis and Integration Laboratory:

Deutschendorf credits a major influence on his development by some of his teachers junior high school teachers in Chattanooga, Tenn. "The two most influential in the sciences were Miss Bagwell for math and Miss Eberhardt for science. Being quite 'cool' at the time, I engaged in my fair share of 'despising' and 'ridiculing.' However, when I finished the ninth grade, I left with utmost respect for them and what they demanded — and pride in what I accomplished in return. They helped inspire a love for the sciences by forcing me to get in knee-deep — though I ended up over my head a couple of times."

Thom Holden, Former Coordinator of Marshall's Cooperative Education Program, as well as some of the graduates of that program, cited the contribution of Mrs. Neva Bright, Secretarial Instructor at J.F. Drake State Technical College. In the words of **Annette Braden Mitchell, Secretary, Systems Analysis and Integration Laboratory:**

"I chose Secretarial Science as my third career. And, as with others, it was because of Mrs. Neva Bright. She gave me a lot of hope and encouragement. I was working and going to school and I didn't think I could handle both. I wanted to quit. Mrs. Bright helped me to realize that, now and then, you will run into hardships and difficulties in life and you can't quit every time you are faced with one. If you had a problem, whether it be school, work, or family-related, she was always there to listen and to give you advice based on her life experience. She not only gave her time, but she gave of herself. She had a great impact on my life."

John Taylor, Director of Public Affairs:

"I always got good grades on writing assignments without having to expend much effort — until tenth grade when I drew a short straw and got the feared English teacher Elmund Melendez. He forced me to start at square one, and structure my work 'by the numbers.' He forced discipline and caused me to really stretch my ability. The better I did, the more he demanded. He equipped me with the skill that made my NASA career possible."

Melissa Van Dyke, Aerospace Engineer, Propulsion Lab:

"I chose a career in engineering because of Mr. Heideman's faith in my abilities. As a junior in high school, satisfied with doing 'just enough,' Mr. Heideman recognized my potential and set aside special time to give me more challenging assignments than the rest of the class. It was then that I realized I could be better than average. Thanks to that little push, I'm about to finish an M.S. degree in engineering."

Neil Rainwater, Verification Team Lead, Systems Analysis and Integration Laboratory:

Rainwater recalls the "initial spark" that would lead to a career in the space program being planted in his mind by an elementary school teacher in Cullman, Ala. "It was when the

Apollo program was winding up the remaining flights to the moon. My teachers (Mrs. Fidler, Mrs. Ingram, Mrs. Freeman, Mrs. Dahlke, and Mrs. Bates) in West Elementary School would bring a television set into the classroom and all the kids from the various classes would get into that one classroom to watch each of the launches and subsequent splashdowns. The teachers believed that those events were important enough to stop the regular classwork and watch. It at least started the desire and enthusiasm in my mind for the space program."

Trafton Announces Retirement

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tenure, the Space Shuttle has safely and successfully flown 13 missions, and the International Space Station program has moved from planning to the production of almost a quarter-of-a-million pounds of flight hardware.

"I have been enormously privileged to lead this terrific team of talented people who make up the wide range of programs represented by the Office of Space Flight," Trafton said. "I could not be prouder of my association with them, or of the work we have done together."

"Wil Trafton has met or exceeded all of the challenges I have placed before him," NASA Administrator Daniel S. Goldin said.

"Through his superior leadership of the Human Exploration and Development of Space enterprise and its many complex programs, the agency is in a better position to meet its goals in space and to do so safely."

Trafton came to NASA as director of the Space Station program in January 1994. In that position he was responsible for overall planning, budgeting and management of the International Space Station, a joint project between the United States, Russia, the European Space Agency, Japan and Canada.

Groundbreaking Held for X-33 Facility

by Tony Jacob

Representatives from NASA, the U.S. Air Force and industry broke ground at the launch site for the X-33 Advanced Technology Demonstrator during a ceremony at Edwards Air Force Base, Calif.

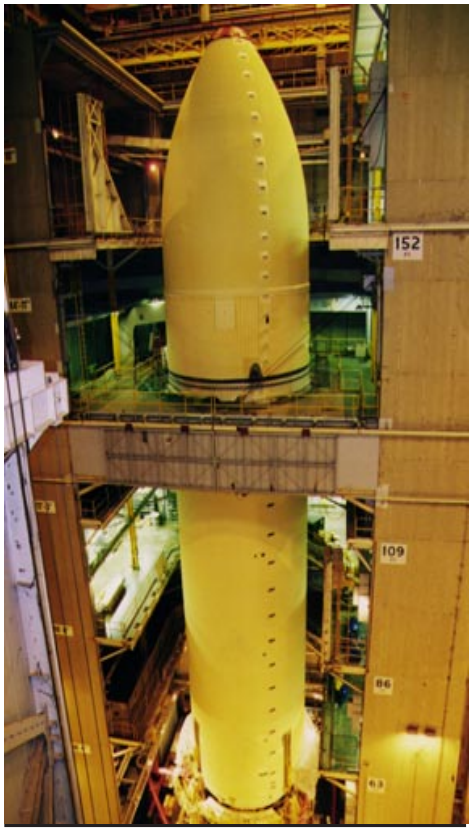
The 25-acre launch site is located on the eastern portion of Edwards, a few hundred yards north of what is known as Haystack Butte. The beginning of construction for X-33 launch facilities marks another major milestone for the program — with other recent milestones including the successful completion of a critical design review for the vehicle and closing out of the environmental impact statement process for X-33. All 15 planned test flights of the X-33 will be launched from the Edwards facility beginning in July 1999. Landing sites are Michael Army Air Field at Dugway Proving Ground, Utah, and Malmstrom Air Force Base, Mont.

Approximately 100 workers will construct the $30 million launch facility, with work scheduled to be completed in a year. Sverdrup Corp., St. Louis, Mo., is overseeing construction of the facility.

Site plans include a retractable vehicle shelter; a rotating vehicle launch mount; storage areas for the liquid hydrogen and liquid oxygen used for fuel, and helium and liquid nitrogen used in vehicle operations; a water storage tank for the sound suppression system; a concrete flame trench; and assorted site infrastructure. The vehicle's operations control center will be located in an existing test control room within Haystack Butte.

NASA and the Lockheed Martin Skunk Works are conducting the X-33 program under a cooperative agreement. The X-33 is a subscale technology demonstration prototype of a commercial Reusable Launch Vehicle (RLV) Lockheed Martin has labeled "VentureStar (tm)," which the company hopes to develop early in the next century. Through development and demonstration flights, the X-33 will provide the information needed for industry to decide by the year 2000 whether to proceed with the development of a full-scale, commercial RLV program.

A full-scale, single-stage-to-orbit RLV could dramatically increase reliability and lower the cost of putting a pound of payload into space from $10,000 to $1,000.



The first Super Lightweight Tank for the Space Shuttle achieved a major production milestone as mating of major components was completed by Lockheed Martin Michoud Space Systems personnel in October. The tank is scheduled for delivery to NASA in January 1998 in support of the May 1998 launch of Space Shuttle mission STS-91, the final scheduled Shuttle/Mir docking mission concluding the joint U.S./Russian Phase 1 Program.

Photo courtesy of Lockheed Martin

A solar thermal propulsion system that could significantly reduce weight, complexity and cost while boosting performance over current, conventional upper stages is being tested in the Marshall Center's X-ray Calibration Facility. the technology development project — known as Shooting Star — features a 6-foot-wide, thin film lens supported by an inflatable frame. The tests are being conducted in a stainless steel vacuum chamber. The solar thermal propulsion efforts are managed by Marshall's Advanced Space Transportation Program.

Photo by Emmett Given

Annual Center Christmas Dance Scheduled for Dec. 6 at VBC

The annual Marshall Center Christmas Dance will be held Dec. 6 in the Von Braun Center Exhibit Hall.

Doors will open for the semi-formal event at 6 p.m., and there will be continuous music from 7 to 11 p.m. by two bands. The Little Big Band will provide "oldies and smoothies," and the Nite Owls will play rock and disco music. The bands will alternate every half hour. Non-alcoholic punch and a variety of hors d'oeuvres will be served, and cash bars will be available.

All seats will be reserved, and NASA employees, retirees, and on-site contractors can purchase tickets for $6 each; guest tickets are $8. Tickets are being sold at the Marshall Activity Building (4752) from 11:30 a.m. to 12:30 p.m. each weekday.

Groups desiring to sit together should purchase all their tickets at the same time. A layout will be provided showing available seats.

The number of tickets to be sold this year will be limited; so make your plans early, get your groups together, and come by Building 4752 to purchase your tickets. No seats will be reserved without the purchase of a ticket.

Microgravity Science Mission

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Curreri of the Marshall Space Sciences Laboratory. "We anticipate considerable application of the fundamental knowledge obtained through the USMP missions to be applied to the mathematical models used to optimize manufacturing processes on earth."

The speed and the amount of information that can be stored and sent by computers and high-tech electronics, using sophisticated semiconductor materials, may be increased by better control of how the semiconductor's crystal structure forms. Extensive research and millions of dollars are invested each year in ground-based efforts to improve semiconductor formation and performance. During the USMP-4 mission, researchers will expand upon these efforts and upon findings from USMP-2 and 3 with further experiments in the Advanced Automated Directional Solidification Furnace. The experiment is led by Principal Investigators Dr. Archibald Fripp of NASA's Langley Research Center and Dr. Sandor L. Lehoczky of Marshall Center's Space Science Laboratory. The goals are to understand how to develop better material processes, material performance and to reduce manufacturing and production costs.

Dr. John Lipa of Stanford University of the Confined Helium Experiment leads a team to understand the size-dependent changes that take place in various material properties through ultra-precise measurements in cooled liquid helium. Better understanding of the effects of miniaturization on material properties should lead to even smaller and even more efficient electronic devices in the future with reduced costs for the consumer.

Another goal of USMP-4 researchers is to understand the process of solidification and to improve metal manufacturing techniques. The Isothermal Dendritic Growth Experiment seeks to unlock advanced processes which will create new alloys that are stronger and have better controlled and more reliable properties than currently available. Research led by Dr. Martin Glicksman of Rensselaer Polytechnic Institute, Troy, N.Y., aims at revealing the secrets of solidifying molten materials that form tiny pine tree-shaped crystals called dendrites. The size, shape and direction of these crystals, particularly for many commercial metal alloys, dictate the key properties of the resulting solid material.

The investigation known as MEPHISTO is an international cooperative program among NASA, the French Space Agency, the French Atomic Energy Commission and the University of Florida. The goal of the MEPHISTO experiment, led by Dr. Reza Abbaschian of the University of Florida in Gainesville, Fla., is to understand how gravity-driven convection affects the production of metals, alloys and electronic materials. MEPHISTO flew on the three previous USMP missions. Its fourth flight will continue the investigation into how materials solidify in microgravity. Ultimately, the MEPHISTO experiments may bring dramatic improvements in the production process of various materials.

Two materials science investigations and one combustion science experiment will be conducted in the MSFC developed

The USMP-4 cargo bay experiments and Multipurpose Experiment Support Structure are moved by over head crane into position aft of the Spartan carrier during preparation for the launch of STS-87. The USMP-4 experiments were the first science payloads to be processed for launch at Kennedy Center's Space Station Processing Facility.

Microgravity Glovebox, located in the Shuttle middeck. This versatile facility offers scientists the capability to conduct experiments, test procedures and develop new technologies in microgravity. The Microgravity Glovebox project scientist is Dr. Donald Reiss of Marshall Center's Space Science Laboratory.

Combustion -- the scientific term for burning -- plays a key role in home heating, air pollution, transportation, propulsion, global environmental heating and materials processing. Dr. Lea-Der Chen of the University of Iowa in Iowa City leads a team that includes researchers from NASA's Lewis Research Center in Cleveland, Ohio. Their experiment , known as Enclosed Laminar Flames, examines phenomena commonly found in combustion processes in power plants, gas turbines, and jet engine afterburners. Results of this investigation will help to optimize the performance of industrial combustors, including pollutant emissions and heat transfer.

The Microgravity Glovebox will also house experiments led by Dr. Barry Andrews, University of Alabama at Birmingham, Birmingham, Ala. (Wetting Characteristics of Immiscibles); by Dr. Doru Stefanescu, University of Alabama in Tuscaloosa, (Particle Engulfment and Pushing by Solid/Liquid Interface); and two experiments led by Melissa Rogers of Lewis Research Center to monitor the slight vehicle and atmospheric disturbances that occur during a typical Space Shuttle flight.

"The USMP-4 team of scientists, controllers and engineers have done a great job getting ready for this upcoming flight," said mission manager Sherwood Anderson of Marshall Center's Flight Projects Office.

Employee Ads

Miscellaneous

★ Serger, MyLock 234, 3 or 4 thread $250. 837-6109
★ Magnavox hi-fi stereo VCR, w/VCR Plus $150. 837-0085
★ 1996 Happy Holidays Barbie doll, $75. 837-3746
★ GE dryer, 3 years old $150. 882-3326
★ Amana heating, air conditioning, gas pack $125; gasoline type pressure washer $130. 852-6952
★ Oak dresser and twin bed $150; twin mattresses and box springs $50 per set. 533-1797
★ GE hot point dishwasher $100. 881-9567
★ Glass top dining table, with two tone tan marble bases $700. 837-5975
★ Dishes, "White Christmas", white with gold trim, ten 5-piece place settings, salt/pepper $150. 881-0551
★ Recliner, Barcalounger, striped - beige, gray, dark orange $75; Bentwood rocker $25. 883-2757
★ Kimber .45 acp, semi-auto, 1911 style pistol $550. 837-0418
★ Sears washer $100; Sears and GE undercounter dishwashers $75 and $50; swing set $100. 881-6040
★ Teeny Beanie Baby set, still in bags $100. 837-8003
★ 1997 Happy Holidays Barbie. 974-6614

Vehicles

★ 1991 Ford Explorer, 4-door, Eddie Bauer, leather, dark green, 54K miles $9,300. 539-0094
★ 1996 Impala SS, black, 62K miles, Borla exhaust, alarm system, custom sound $19,000. 350-0275 after 6 p.m.
★ 1985 Ford Econoline F150 van, air, AM/FM radio, 84K miles, new tires $3,500. 586-3413
★ 1996 Corsica Chevy, 4-door, automatic, a/c, gray, 39K miles, 4 cylinder $7,888. 852-7982
★ 1991 Ford Explorer XLT, 4-door, 2-wd, leather, trailer hitch, cruise, 130K miles $6,000. 859-4156
★ 1996 Silver Mitsubishi Galant with 28K miles. Please leave message if no answer $14,500. 882-6012
★ 1982 Dodge Rampage, 88K miles, auto, air, transmission, body rough $1,000 o.b.o. 828-2466

Wanted

★ Set of Golf Clubs. 881-1718

Lost

★ Serengetti drivers sunglasses, black wire frames, amber lenses, lost Nov. 7. 722-0882

Found

★ Motorola beeper found in North parking lot of Building 4200, call 4-4578 to identify.

Center Announcements

☛ ***Annual Nut Sale*** — Marshall employees, retirees, and on-site contractors may purchase pecans (fancy mammoth halves), for $4.85 for the 16 oz. bag; chocolate-covered pecans for $6.75 per lb.; hickory smoked almonds for $3.90 per lb.; roasted, salted (in shell) natural pistachios for $3.45 per lb.; natural, whole almonds for $3.90 per lb.; English walnuts for $4.40 per lb.; jumbo raw peanuts for $1.75 per lb.; honey roasted almonds for $3.90 per lb. and dry roasted cashews at $5.40 per lb. They will go on sale weekdays from 8 a.m. until 4 p.m. beginning Nov. 21 in the MSFC Activities Building (4752) on a first-come/first-served basis.

☛ ***MOO*** — Due to the Thanksgiving holiday, the Management Operations Office retirees will meet for breakfast/lunch on Nov. 20 at the Cracker Barrel in Madison at 10 a.m. If any questions, call 539-0042.

☛ ***Bloodmobile Visit*** — The American Red Cross will be at Bldg. 4752 on Nov. 21 until 1:30 p.m. T-Z, 8 a.m., Q-S, 8:30 a.m., M-P, 9 a.m., I-L, 9:30 a.m., F-H, 10 a.m., C-E, 10:30 a.m., A-B, 11 a.m. Marshall employees who serve as blood donors without compensation will be authorized 4 hours of excused absence. Contractor personnel will comply with the policy of their respective companies.

☛ ***Black History*** — All interested parties are invited to participate in the annual Black History Program scheduled for February 1998. Volunteers are needed to serve on various committees to help plan activities that will be presented throughout the month of February. Please contact Jan Matthews at 4-0420 or Ollie Ragland at 4-0352 or by e-mail. Responses are due NLT Nov. 11.

☛ ***MARC*** — The Marshall Amateur Radio Club will meet on Nov. 20 at 11:30 a.m. in Bldg. 4622. Call Scott Akridge at 4-1510 for more information.

☛ ***Barber & Styling Shop*** — The S&H Barber and Styling Shop will be closed Nov. 27-28 for Thanksgiving. The barbers will be on duty M-W the week of Nov. 24. Please call 881-7932 for an appointment.

☛ ***FEHB*** — The Federal Employee Health Benefits open season extends from Nov. 11 thru Dec. 8. Comparison charts and brochures will be available through your administrative office starting approximately the first week in November.

☛ ***Personnel Office*** — The Personnel Office has moved to Bldg. 4200, 3rd floor. The TSP and health insurance information can be picked up from room 328. Contact Debbie Allen at 4-7536 for more information.

☛ ***1997-98 Hoops*** — The 1997-98 MSFC basketball season is underway. The league will be structured as it has been in the past with three divisions and will begin in late November and run through March. If you are interested in entering a team or if you are looking to join a team, call Chris Calfee at 4-5788 or e-mail at chris.calfee@msfc.nasa.gov.

☛ ***MARS Dance Club*** — The MARS Ballroom Dance Club is offering foxtrot and tango lessons ($8 per person) from 7 to 8 p.m. Nov. 24. The classes will be held in the Parish Hall of Saint Stephen's Episcopal Church at 8020 Whitesburg Drive. These lessons are available to club members and their partners/guests. For more info. call Pat Sage at 544-5427.

☛ ***MESA*** — The MESA monthly meeting is scheduled Nov. 20 at 11:30 a.m. in the northeast end of building 4471, room C-105.

☛ ***Fire Prevention Week*** — As part of the "Focus on Safety Day," the Industrial Safety and Environmental Health Offices held a Safety & Health Fair Oct. 15 in Bldg. 4200, room G13. The following prizes were awarded: Winners of the eight fire extinguishers were: David Schaefer/MG21, Tammie Thompson/I-NET, Jim Windham/CSC, Melanie Aldredge/JA10, John Davis/EH41, Dorothy Holloway/AE01, Becky Beasley/PWI, and Stan Smetzer/ED52; cordless screwdriver, John Pea/SA71; $25 gift certificate, Leonard Gurley/MSI; safety glasses, Greg McDaniel/EJ44; Karen Owens/BNA; Glen Jones/EL24; Mag light, Danny Walker/BE01; Buck knife, Willie Love/CE01; Igloo cooler, Carolyn Clifford/JA31; protective rain suit, David Guy/GP18; first-aid kits, Kathy Brown/CE01; Deborah McCullough/EJ71; fire extinguishers, Mark Hamilton/SA52; Randy Silver/EM41; David Harris/EP01, Mary Chamblee/RSSC, Norma Bolander/BG01 and George Harsh/EE31; cookbooks, Pat Brinkley/JA31 and Becky Eiford; umbrella, Angie Daniels/BNA; ProVent jackets, Troy Vest/Redstone Fire Department and Nancy McNeill/BR01; Assorted bread basket, Frank Thomas/ED53; certificates for free radon tests, Paul Brown/RSSC and Sylvia Battles/CSC; space station medallion, Julia Reynolds/CSC; safety shoes, Martha Allen/SA24; sleep evaluation test, Larue Stewart/BR01; boating safety class, Bob Goss/EJ41; Huntsville Hospital classes (safesitter, girl talk, guy talk), Ann Westendorf/CE01, Marianne Huie/PP04 and Roena Love/JA61; pumpkin flashlights and reflectors, David Crutcher/CN31M, Frank Olinger/HEI, Julie Scott/CR65, CW Dunbar/JA01, Mike McLean/GP46, Luther Brooks/ROC, Kathy Brown/CE01, Barbara Feaster/AB21, Deborah McCullough/EJ71 and Pat Sibley/EH52.

Job Opportunities

CPP 98-8-JB, Management Analyst, GS-343-9/11, with promotion potential to GS-11. Space Shuttle Projects Office, Systems Management & Integration Office. Closes Nov. 20.

MARSHALL STAR

Marshall Space Flight Center, Alabama 35812

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